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**COORDINATED ISSUE
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RESEARCH TAX CREDIT- QUALIFIED RESEARCH
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Note: A Coordinated Issue Paper ordinarily analyzes a complex legal issue in the context of specific facts, with the analysis having general application. Within this context, this Coordinated Issue Paper addresses the requirements for qualified research under I.R.C. § 41(d) as to a specific business component and provides analysis that should be useful in determining what is qualified research under various factual circumstances.

ISSUE

Do X's activities related to the development of an improved toaster to be held for sale constitute "qualified research" within the meaning of § 41(d)(1)¹ of the Internal Revenue Code?

CONCLUSION

X's activities related to the development of a new heating element for integration into X's improved toaster constitute qualified research under § 41(d)(1) because X's activities satisfy the requirements for qualified research. The new heating element represents a significant subset of elements of the original business component, the toaster, and is treated as a new and separate business component.

FACTS

X is a domestic corporation that designs, develops, manufactures, and sells various kitchen appliances. X's research scientists generally perform all of X's research and development in-house.

In 1993, X initiated a project to determine if material A could be used to construct heating elements for kitchen appliances, in particular, toasters. At that time, skilled professionals in the relevant fields of technology or science (for example, electrical engineering, metallurgy, thermochemistry) had not constructed a heating element using

¹ Unless otherwise indicated, all section references are to the Internal Revenue Code of 1986.

Please note that the analysis of this paper's fact pattern is based upon the statute and the legislative history and not upon the proposed regulations published in the Federal Register on January 2, 1997 (62 Fed. Reg. 81) and December 2, 1998 (63 Fed. Reg. 66,503). Although proposed regulations do not have authoritative weight and should not be cited as authority, examiners may consider them in reaching a determination. When the regulations become final, examiners must follow them, and this paper will be revisited if it needs to be revised.

material A nor had they determined if material A could be used to construct a new heating element.

X's principal objective in using material A was to construct a new heating element that could increase substantially the rate at which heat was first dispersed through and then dissipated from a toaster. In addition, material A cost significantly less than the materials X currently used to construct heating elements.

After extensive research, X's scientists determined that a heating element constructed with material A could increase the rate at which heat was dispersed through a toaster; as a result, bread could be toasted in half the time it took for any other toaster on the market. In addition, the heating element constructed with material A cooled down at twice the speed of any existing heating element. X's scientists recorded the results of their research.

Based upon this breakthrough, X decided to develop a new toaster for its kitchen appliance product line and constructed a rapid-heat-and-cool heating element using material A. As constructed, the new heating element was fully self-contained and resembled, from a design standpoint, existing heating elements that X developed. The introduction of the new heating element constructed with material A into the toaster that X currently carried in its product line did not pose any significant integration challenges. X also redesigned the toaster to give it a "high-tech" appearance to enhance its marketability as a product incorporating the newest technology. In 1995, X introduced the improved toaster to the market.

X treated all of the expenses incurred in developing the improved toaster as qualified research expenses.

LAW

The research credit was originally enacted by the Economic Recovery Tax Act of 1981 (the 1981 Act) to provide an incentive to taxpayers to conduct certain types of product development research activities and certain basic research. The definition of the term "qualified research" was amended by the Tax Reform Act of 1986 (the 1986 Act). Prior to amendment, the term "qualified research" had the same meaning as the term "research or experimental" under § 174. The legislative history to the 1986 Act indicates that Congress believed that taxpayers had applied the 1981 Act definition too broadly with some taxpayers claiming the credit for virtually any expense relating to product development. Further, Congress concluded that it was appropriate and desirable for the statutory research credit provisions to include an express definition of the term "qualified research." Thus, in 1986, Congress narrowed the scope of the credit to technological advances in products and processes, and revised and limited the definition of the term "qualified research" by establishing additional qualifying requirements and adding several excluded activities. S. Rep. No. 99-313, at 694-95 (1986); H.R. Rep. No. 99-426, at 178 (1985).

Section 41 allows taxpayers a credit against tax for increasing research activities. Generally, the credit is an incremental credit equal to the sum of 20 percent of the excess (if any) of the taxpayer's "qualified research expenses" for the taxable year over the base amount, and 20 percent of the taxpayer's basic research payments. Under § 41(c)(4), however, taxpayers may elect to use the alternative incremental research credit.

Section 41(b)(1) provides that the term "qualified research expenses" means the sum of the following amounts which are paid or incurred by the taxpayer during the taxable year in carrying on any trade or business of the taxpayer: (A) in-house research expenses, and (B) contract research expenses.

Section 41(d)(1) provides that the term "qualified research" means research--

- (A) with respect to which expenditures may be treated as expenses under § 174,
- (B) that is undertaken for the purpose of discovering information (i) that is technological in nature, and (ii) the application of which is intended to be useful in the development of a new or improved business component of the taxpayer, and
- (C) substantially all of the activities of which constitute elements of a process of experimentation for a purpose described in § 41(d)(3).

Such term does not include any activity described in § 41(d)(4).

Section 41(d)(2)(A) provides that the tests for qualified research in § 41(d)(1) are to be applied separately with respect to each business component of the taxpayer. Section 41(d)(2)(B) provides that the term "business component" means any product, process, computer software, technique, formula, or invention that is to be (i) held for sale, lease, or license, or (ii) used by the taxpayer in a trade or business of the taxpayer.

Section 41(d)(3)(A) provides that, for purposes of § 41(d)(1)(C), research is to be treated as conducted for a qualified purpose if it relates to (i) a new or improved function, (ii) performance, or (iii) reliability or quality. Section 41(d)(3)(B) provides that research is not to be treated as conducted for a qualified purpose if it relates to style, taste, cosmetic, or seasonal design factors.

Section 41(d)(4) provides that the term "qualified research" does not include any of the following: research after commercial production; adaptation of an existing business component; duplication of an existing business component; surveys, studies, etc.; research with respect to certain computer software; foreign research; research in the social sciences, etc.; and funded research.

The legislative history to the 1986 Act states that the purpose of enacting the credit was to encourage business firms to perform the research necessary to increase the innovative qualities and efficiency of the U.S. economy. S. Rep. No. 99-313, at 694; H.R. Rep. No. 99-426, at 177.

The Conference Report to the 1986 Act provides that research satisfying the § 174 expensing definition is eligible for the credit only if the research is undertaken for the purpose of discovering information (a) that is technological in nature, and also (b) the application of which is intended to be useful in the development of a new or improved business component of the taxpayer. In addition, such research is eligible for the credit only if substantially all of the activities of the research constitute elements of a process of experimentation for a functional purpose. H.R. Conf. Rep. No. 99-841, at II-71 (1986).

The determination of whether the research is undertaken for the purpose of discovering information that is technological in nature depends on whether the process of experimentation utilized in the research fundamentally relies on principles of the physical or biological sciences, engineering, or computer science--in which case the information is deemed technological in nature--or on other principles, such as those of economics--in which case the information is not to be treated as technological in nature. H.R. Conf. Rep. No. 99-841, at II-71.

With reference to the field of computer science, specifically, the Conference Report notes that research does not rely on the principles of computer science merely because a computer is employed. Research may be treated as undertaken to discover information that is technological in nature, however, if the research is intended to expand or refine existing principles of computer science. H.R. Conf. Rep. No. 99-841, at II-71 n.3 (1986).

The term "process of experimentation" is defined in the Conference Report as a process involving the evaluation of more than one alternative designed to achieve a result where the means of achieving that result is uncertain at the outset. This may involve developing one or more hypotheses, testing and analyzing those hypotheses (through, for example, modeling or simulation), and refining or discarding the hypotheses as part of a sequential design process to develop the overall component. Thus, for example, costs of developing a new or improved business component are not eligible for the credit if the method of reaching the desired objective (the new or improved product characteristics) is readily discernible and applicable as of the beginning of the research activities, so that true experimentation in the scientific or laboratory sense would not have to be undertaken to develop, test, and choose among viable alternatives. On the other hand, costs of experiments undertaken by chemists or physicians in developing and testing a new drug are eligible for the credit because the researchers are engaged in scientific experimentation. H.R. Conf. Rep. No. 99-841, at II-71.

The Conference Report provides that if the requirements of § 41 are not met with respect to a product, process, computer software, technique, formula, or invention held for sale, lease, or license, or used by the taxpayer in the trade or business of the taxpayer, but are met with respect to one or more elements thereof, the term “business component” means the most significant set of elements of such product, process, computer software, technique, formula, or invention with respect to which all requirements are met. Thus, the requirements are applied first at the level of the entire product, process, computer software, technique, formula, or invention held for sale, lease, or license, or used by the taxpayer in the trade or business of the taxpayer. If all aspects of the requirements of § 41 are not met at that level, the test applies at the most significant subset of elements of the product, process, computer software, technique, formula, or invention. This “shrinking back” of the product is to continue until either a subset of elements of the product that satisfies the requirements is reached, or the most basic element of the product is reached and such element fails to satisfy the test. H.R. Conf. Rep. No. 99-841, at II-72-73.

Finally, the Conference Report provides that a plant process, machinery, or technique for commercial production of a business component is treated as a different component than the product being produced. Thus, research relating to the development of a new or improved production process is not eligible for the credit unless the definition of qualified research is met separately with respect to such production process research, without taking into account research relating to the development of the product. H.R. Conf. Rep. No. 99-841, at II-73.

On December 2, 1998, the Service published in the Federal Register (63 Fed. Reg. 66,503) proposed regulations relating to the computation of the credit under § 41(c) and to the definition of qualified research under § 41(d). The proposed regulations were written to reflect the views of Congress as contained in the legislative history to the 1986 Act as well as the legislative history to the Tax and Trade Relief Extension Act of 1998. In extending the credit, Congress addressed the scope of the term “qualified research” and noted, in particular, that

evolutionary research activities intended to improve functionality, performance, reliability, or quality are eligible for the credit, as are research activities intended to achieve a result that has already been achieved by other persons but is not yet within the common knowledge (e.g., freely available to the general public) of the field (provided that the research otherwise meets the requirements of section 41, including not being excluded by subsection (d)(4)).

H.R. Conf. Rep. No. 105-825, at 1548 (1998). See United Stationers, Inc. v. United States, 982 F. Supp. 1279 (N.D. Ill. 1997), aff’d, 163 F.3d 440 (7th Cir. 1998), cert. denied, 119 S. Ct. 2369 (1999); Norwest Corporation v. Commissioner, 110 T.C. 454 (1998).

ANALYSIS

The research credit provides an incentive for business firms to increase their expenditures for research to obtain new knowledge through a scientific process of experimentation. Consequently, the credit is not to be applied too broadly or in a manner such that virtually any expense relating to product development is eligible for the credit. See S. Rep. No. 99-313, at 694-95; H.R. Rep. No. 99-426, at 178. Moreover, the credit is not available for an expenditure merely because the expenditure satisfies the requirements of § 174. See Norwest, 110 T.C. 454, 492-93 (1998).

For taxable years beginning after December 31, 1985, a research project is qualified research only if the activities meet all of the requirements of § 41(d)(1) and are not otherwise excluded under § 41(d)(3)(B) or (d)(4). Section 41(d)(1) contains three principal requirements for determining whether product development activities constitute qualified research. These requirements are (1) the “section 174 test,” (2) the “discovery test,” and (3) the “process of experimentation test.” See Norwest, 110 T.C. at 488-89 (delineating a four-part test by treating the “business component” element of the “discovery test” as a separate, self-contained test).

A. Application of the § 41(d)(1) Requirements and the “Shrinking-back” Rule to the Improved Toaster²

Section 41(d)(2) provides that the requirements for qualified research will be applied to each business component of the taxpayer separately. For purposes of this paper, X’s improved toaster is the business component to which the requirements of § 41(d) will be applied first. See H.R. Conf. Rep. No. 99-841, at II-72-73. Viewed as a whole, X’s improved toaster includes a new heating element constructed with material A. Should the improved toaster viewed as a whole fail to satisfy one of the requirements, then expenditures attributable to the development of the improved toaster will not qualify for the research credit. The qualified research requirements then will be applied, however, at the most significant subset of elements of the original business component (i.e., the improved toaster). For purposes of this paper, the new heating element constructed with material A will be treated as representing the most significant subset of elements of the original business component.

1. The “Section 174 Test”

The first requirement for qualified research is the “section 174 test” found in § 41(d)(1)(A). Section 41(d)(1)(A) provides that an activity may constitute qualified research if the activity is research with respect to which expenditures may be treated as

² The application of the “shrinking-back” rule will vary from case to case, depending upon the facts and circumstances of each case and, in particular, upon the amount of information provided by the taxpayer with respect to the original “business component,” as defined under § 41(d)(2)(B). It may be helpful, however, to consider the “shrinking-back” rule in a taxpayer-favorable light to the extent the rule permits the taxpayer to claim a research credit for discrete features of a business component when the credit may be otherwise unavailable for the original business component.

expenses under § 174. Under these facts, X's research activities were focused upon improving the toaster X currently carried in its kitchen appliance product line and, in particular, upon giving the toaster a "high-tech" appearance to enable X to market the improved toaster containing the new heating element. X was uncertain as to the appropriate design for the product. Specifically, X did not have the requisite information to determine the best method for integrating the new heating element into its existing toaster. Because the expenditures X incurred in the development of the improved toaster viewed as a whole are for activities intended to eliminate uncertainty concerning the development of the product, such costs represent research and development costs in the experimental or laboratory sense. Accordingly, X has satisfied the first requirement for qualified research.

2. The "Discovery Test"

The second requirement for qualified research is the "discovery test" found in § 41(d)(1)(B). The "discovery test" contains two distinct elements. First, § 41(d)(1)(B)(i) provides that research must be undertaken for the purpose of discovering information that is technological in nature; second, § 41(d)(1)(B)(ii) provides that the application of the discovered information must be intended to be useful in the development of a new or improved business component of the taxpayer. The legislative history indicates that the term "discovering information" means obtaining knowledge that expands or refines the common knowledge of skilled professionals in a particular field of technology or science. H.R. Conf. Rep. No. 99-841, at II-71-72 & n.3. See Norwest, 110 T.C. at 494-95 (noting that expanding or refining the principles of the "hard sciences" are two, but not the exclusive, ways of satisfying Congress' goal of stimulating a higher rate of capital formation and improving the U.S. economy). Thus, to satisfy the "discovery test" under these facts, X must show that its activities for the development of the improved toaster were directed at obtaining knowledge that expands or refines the common knowledge of skilled professionals in a particular field of technology or science, and that application of the discovered information was intended to be useful in the development of a new or improved business component.

As regards the "discovery" element of the "discovery test," "qualifying research must go beyond the current state of knowledge in that field--expand or refine its principles. . . . In the context of § 41(d)(1)(B)(i) discovery demands something more than mere superficial newness; it connotes innovation in underlying principle." United Stationers, 163 F.3d 440, 445. See Norwest, 110 T.C. at 495. In addition, the "discovery" element of the "discovery test" is limited to research that is technological in nature. Thus, research activities for purposes of the discovery process must fundamentally rely on the principles of the physical or biological sciences, engineering, or computer science. Considering the development of the improved toaster as a whole, the specific issues X addressed were limited to the integration of the new heating element constructed with material A into the improved toaster and giving the improved toaster a "high-tech" appearance. X's current product line of toasters and toaster ovens, as well as other appliances, contained heating elements. X's new heating element was fully self-contained and resembled, from a design standpoint, existing heating elements that X

developed. Thus, X's activities to integrate the new heating element into its existing toaster and to give the toaster a "high-tech" appearance did not expand or refine the common knowledge of skilled professionals in the relevant field of technology or science. X's activities also did not fundamentally rely on the principles of the physical or biological sciences, engineering, or computer science. Therefore, X has failed the "discovery" element of the "discovery test."

The "business component" element of the "discovery test" found in § 41(d)(1)(B)(ii) provides that qualified research that is undertaken for the purpose of discovering information that is technological in nature must be intended to be useful in the development of a new or improved business component of the taxpayer. Under these facts, X clearly intended to develop a new or improved business component when it undertook to improve its existing toaster. Thus, X has satisfied the "business component" element of the "discovery test." Having failed the "discovery" element of the "discovery test," however, X has failed the second requirement for qualified research.

3. The "Process of Experimentation Test"

The third requirement for qualified research is the "process of experimentation test" found in § 41(d)(1)(C), providing that substantially all of the activities which constitute elements of a process of experimentation must relate to a new or improved function, performance, reliability or quality, and must not relate to style, taste, cosmetic, or seasonal design factors. A primary requirement for the "process of experimentation test" is that the research activities address at the outset technical uncertainty as to the means or method of achieving a research result. See United Stationers, 163 F.3d at 446; Norwest, 110 T.C. at 496. While the discovery of information for purposes of §174 is intended solely to eliminate uncertainty concerning the development or improvement of a particular product, the process of experimentation definition in § 41(d)(1)(C) delineates the method of discovering information. See Norwest, 110 T.C. at 496.

The "process of experimentation test" generally presupposes a scientific methodology that may entail the evaluation of more than one alternative to achieve a result where the means of achieving that result is uncertain at the outset. The more alternatives which are available to the taxpayer, the more structured the process of experimentation necessarily becomes through a continuous development of hypotheses that require testing and analysis until the research objective is achieved. Thus, the more hypotheses that are developed, tested, analyzed, the more likely the project will satisfy the "process of experimentation test." See Norwest, 110 T.C. at 496.

Under the present facts, there was no uncertainty concerning X's technical ability to integrate a new heating element into its existing toaster because X clearly possessed the technical ability to design a product that incorporated this feature. Finally, expenditures related to the "high-tech" appearance of the improved toaster are excluded from credit consideration because such activities relate to style, taste,

cosmetic, or seasonal design factors. See § 41(d)(3)(B). Accordingly, X has failed the third requirement for qualified research.

4. Summary

Based upon the above, X has failed to meet two out of the three principal requirements for qualified research for the business component of the improved toaster viewed as a whole. Therefore, X cannot claim a research credit for the original business component. Under the “shrinking-back” rule, however, the qualified research requirements now may be applied to activities related to the development and construction of the new heating element with material A to the extent the heating element represents the most significant subset of elements of the original business component (i.e., the improved toaster). Thus, for purposes of applying the requirements for qualified research, the new heating element constructed with material A will be treated as a separate business component.

B. Application of the § 41(d)(1) Requirements to the Most Significant Subset of Elements of the Business Component: the New Heating Element Developed with Material A

1. The “Section 174 Test”

Section 174, as distinguished from § 41, does not require technical uncertainty as a basis for qualification. Under § 174, the focus is upon the nature of the activity and not upon the level of technological advancement or functional improvement. Under these facts, the expenditures that X incurred to construct the new heating element from material A, a material that had never been used before in this way, represent research and development costs in the experimental or laboratory sense because these costs are for activities intended to eliminate uncertainty concerning the development or improvement of a product. X did not have the requisite information to establish the method for developing the heating element and X's scientists were uncertain as to what would constitute the appropriate design for the heating element.

2. The “Discovery Test”

X's development of the new heating element using material A involves the discovery of information that is technological in nature and the application of which is intended to be useful in the development of a new or improved business component. To construct the heating element, X developed and used material A, a material that had never been used before in this way. Thus, X was required to discover information about material A that expanded or refined the common knowledge of skilled professionals in a particular field of technology or science. In addition, X intended to develop a new or improved business component (that is, a product with enhanced performance) when it undertook to improve its existing toaster and, likewise, when it undertook to construct with material A a new heating element that heated up and cooled down more quickly than any other heating element on the market.

X discovered information about material A that expanded or refined the common knowledge of skilled professionals. Further, X intended to develop a new or improved business component with the knowledge obtained about material A for the construction of the heating element. Thus, X has satisfied the two distinct elements of the “discovery test” for qualified research.

3. The “Process of Experimentation Test”

As stated above, a principal requirement for the “process of experimentation test” is that the research activities address at the outset technical uncertainty as to the means or method of achieving a research result. A process of experimentation may entail the evaluation of more than one alternative to achieve a result where the means of achieving that result is uncertain at the outset. See Norwest, 110 T.C. at 496; United Stationers, 163 F.3d at 446. Because X developed material A to construct the new heating element through a process of experimentation that entailed the evaluation of more than one alternative to achieve a result where the means of achieving that result was uncertain at the outset, X has satisfied the third requirement for qualified research.

4. Summary

X has satisfied the three principal requirements for qualified research for the construction of the new heating element using material A. Therefore, X is eligible for a research credit for costs attributable to the construction of the new heating element using material A.